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ABSTRACT

This interim report on the National Day Care Study (NDCS) presents preliminary findings of the 4-year research program designed to answer major policy questions about federal funding of center-based preschool day care. Major NDCS objectives have been to determine the impact of variations in staff-child ratio, group size, and staff size and qualifications on both the development of preschool children and the costs of center care. This document outlines the policy context within which the NDCS has been conducted, discusses its major objectives and overall design, and concludes with a presentation of preliminary findings and their implications, particularly the implications for Federal Interagency Day Care Requirements (FIDCR). The NCDS consists of a major cost-effects study, to which most of this report is devoted, and two substudies, from which findings are also included: an Infant Day Care Study (focusing on group care for children under 3 in 54 centers) and a Supply Study (a nationwide telephone survey of 3,100 centers). The major study has involved 1,800 children, 1,100 parents, caregivers in 120 classroom groups, and program and cost data gathered from 57 centers in Atlanta, Detroit and Seattle. (BF)

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National Day Care Study

Day Care Division • Administration for Children, Youth and Families

Preliminary Findings and their Implications

31 January 1978

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This report contains preliminary findings based on data from Phase II and Phase III of the National Day Care Study (NDCS). The statements and conclusions contained herein are those of Abt Associates and do not necessarily reflect the views of the sponsoring agency.

The basic policy framework and study design are reported in the *National Day Care Study First Annual Report, Volume I: An Overview of the Study* and *Volume II: Phase II Design* (Cambridge, MA: Abt Associates, 1976). Phase II results and the design for Phase III are presented in the *National Day Care Study Second Annual Report* (Cambridge, MA: Abt Associates, 1977). Final results from Phase II as well as the results from the National Day Care Supply Study and the Infant Day Care Study will be presented in reports published during summer 1978.

Single copies of the NDCS *First* and *Second Annual Reports* may be ordered from:

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PREFACE AND ACKNOWLEDGMENTS

The National Day Care Study (NDCS) is scheduled for completion on 31 July 1978. This report of preliminary NDCS findings was prepared during January 1978. This early release date has made the study's preliminary results available to writers of a report on the appropriateness of the current Federal Interagency Day Care Requirements (FIDCR), which govern day care centers and family day care homes serving federally subsidized children.

That report is being prepared by a task force of the Department of Health, Education and Welfare (HEW) for Secretary Califano's April delivery to Congress. It is part of a series of events planned to provide a better information base than has previously existed for clarifying the federal government's role in day care and for revising current federal day care regulations.

The NDCS was initiated by the Administration for Children, Youth and Families prior to the Congressional mandate for a report on the appropriateness of the FIDCR. Thus the study has a design and timetable of its own. However, given the importance of using the best information available for imminent policy and legislative decisions the study's analytic plans were structured to provide early findings relevant to the appropriateness of the FIDCR. These findings address the controversial issue of whether day care center characteristics that can be controlled by federal regulation make a meaningful difference for children.

Many additional analyses will be completed in February and March. These will be interpreted, made available for review in May and June, and published in final form by August. Results of these expanded and refined analyses will aid the drafters of revised federal day care regulations in formulating precise regulatory language and setting appropriate levels for regulated center characteristics. At the current stage of analysis, presentation of specific numbers and greater statistical detail would be premature. The purpose of this report is to sketch, as clearly and responsibly as possible, the picture that has thus far emerged of the elements that contribute to the quality of children's day care experiences.

Many people participated in the preparation of this document under the technical coordination of the study's Associate Project Director, Jeffrey Travers. In addition to those shown on the title page, representatives of the twenty-five person NDCS consultant group, on very short notice, reviewed several drafts: Jean Carew, John Dill, Asa Hilliard, Richard Light, William Meyer, Daniel Ogilvie, Elizabeth Prescott, Mary Rowe, Nancy Travis and James Young. Gwen Morgan provided writing support in addition to review, especially in the summary which follows.

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SUMMARY OF PRELIMINARY FINDINGS, 31 JANUARY 1978

Overview

The National Day Care Study (NDCS) is a four-year study of center-based preschool day care. It was initiated in 1974 by the Office of Child Development (now Administration for Children, Youth and Families) for completion in 1978. The major objective of the NDCS is to determine the impact of variations in staff/child ratio, number of caregivers, group size and staff qualifications on both the development of preschool children and the costs of center care. In addition, the study is exploring the impact of other center characteristics (e.g., educational program and physical environment) on the quality and cost of day care.

As of January 1978, the study's staff have observed and tested 1800 children, interviewed 1100 parents, observed and interviewed caregivers in 120 classroom groups, and gathered program and cost data from 57 centers located in Atlanta, Detroit and Seattle (sites selected to represent both geographic and center diversity). A small substudy, the Infant Day Care Study, has focused on group care for children under three. In addition, the NDCS Supply Study, a national survey of center-based care across 3100 day care centers, has provided a profile of care available nationally and by state.

The first stage of data analysis is currently being completed. While many more analytic tasks are to be completed prior to publication of the final report in August 1978, clear patterns have begun to emerge:

Major Findings

1. **Different centers have different effects on children.** The quality of the human environment in day care varies significantly from center to center. These differences are linked to center characteristics currently regulated by the federal government.

2. **Small groups work best.** The size of the group in which the preschool child spends her/his day care hours makes the most difference. Small numbers of children and small numbers of adults, interacting with each other, make up the kind of groups that are associated with better care for children.

3. **Staff specialization in child-related fields also makes a difference.** While formal education per se does not make a difference, specialization in a child-related area is linked to quality care.

4. **For preschoolers, minor variations in staff/child ratio have less effect than group size.** If the group is too large, adding caregivers will not help. In groups with small numbers of children and caregivers, minor variations in ratio have little or no impact.

5. **Costs are not necessarily affected significantly by group size.** They are, however, affected by staff/child ratio, by the amount of education caregivers have, and by the length of time caregivers have worked in the center.

6. **Some determinants of quality in center care for infants are different from those for preschool children.** High staff/child ratios, not just small groups, are associated with less stress on children and staff. As with preschool care, staff qualifications influence the quality of infant care.

7. **Centers that receive some or all of their income from the federal government are different from centers that rely on parent fees.** Centers serving federally subsidized children have higher staff/child ratios, offer a broader range of supplementary services to children and families, and use more staff providing specialized services, such as nurses or nutritionists.

8. **Racial and economic segregation is not more prevalent in federally subsidized centers than in parent-fee centers.** However, most of the center-based care used by low-income and minority families is provided in subsidized centers.

9. **Almost two-thirds of the federally subsidized centers have sufficient classroom staff to comply with federal ratio requirements.**

Implications of Results

These preliminary findings constitute only a small part of the contribution that will ultimately be made by the NDCS when it is completed. However, because current findings are focused on the critical factors most often regulated, they have implications for standards and regulations in general and, more specifically, for the appropriateness of the Federal Interagency Day Care Requirements (FIDCR).

First and most fundamentally, any regulatory strategy designed to foster maximum developmental benefits for children should specify allowable numbers of children and caregivers in each classroom group and should also require that at least one caregiver per classroom have specialized preparation in a child-related field. To achieve maximum effects, regulations cannot focus on any one component of group composition, caregiver qualifications, or any other factor that may be found important for quality of care, *in isolation.* Every day care classroom has one or more caregivers at some level(s) of qualifications and has a group composition that can be described in terms of any two of three elements – number of caregivers, number of children (group size), and the resulting staff/child ratio.* To be effective, regulations should specify *configurations* of children and caregivers, with minimum qualifications defined for at least one caregiver per group.

Second, although staff/child ratio regulations have been the focus of most public attention and controversy, clear findings on the importance of group size in preschool classrooms suggest a shift in regulatory emphasis toward this more easily understood and measured factor. This shift in emphasis does not mean that ratio requirements should be omitted from future versions of state and federal regulations, but rather that ratio should be seen as the outcome of setting limits on the number of children and caregivers in the group and not as the principal means of ensuring quality. There is little indication that final NDCS results will lead to recommendations more stringent than the current FIDCR ratio requirements. On the contrary, current findings appear to indicate that ratios slightly above or below those permitted by the present FIDCR can be consistent with positive day care environments for children, if group size limits are appropriately set.

Third, even in effective centers, group sizes and staff/child ratios vary by time of day, type of activity, season of the year and often by children's ages. Therefore, while the standards themselves must be specific, regulatory codes and monitoring practices should be designed to take this dynamic aspect of center care into account.

Fourth and finally, because no major differences in effects from site to site have emerged so far, the study offers no evidence that the key FIDCR components should not be included in a single set of nationally applicable standards.

**When any two of these elements are specified, the third is fixed mathematically.*

INTRODUCTION

This report outlines the policy context within which the NDCS has been conducted, discusses the study's major objectives and overall design and concludes with a presentation of preliminary findings. These findings have important implications for the Congressionally mandated report on the appropriateness of the Federal Interagency Day Care Requirements (FIDCR) and for the directions taken by the Secretary of Health, Education and Welfare in revising the FIDCR. Subsequent analyses will provide more detailed information, useful in formulating new regulations, on the cost/effects trade-offs associated with specific configurations of regulatable characteristics.

POLICY CONTEXT

In recent years the federal government's role as a purchaser of child care has expanded. With this expansion, increasing public and governmental attention focused on the quality of care purchased with federal dollars. The Federal Interagency Day Care Requirements, first established in 1968, were a direct response to this concern for quality. Designed to prevent harm and promote the development of children in federally subsidized care, the FIDCR cover a wide variety of center characteristics, including groupings of staff and children, staff qualifications, suitability and safety of facilities, parent involvement, and supplementary services to children and families.

In 1975, a modified version of the FIDCR was attached to Title XX of the Social Security Act. Under this 1975 law, states were permitted to spend Title XX child care funds only in facilities that met the FIDCR. Severe financial penalties were to be levied for noncompliance. The impending enforcement of the FIDCR provoked a storm of controversy, particularly over the FIDCR's high* staff/child ratio requirements.

It became clear that implementation of the FIDCR would have cost consequences for providers, states and/or the federal government. Congress suspended enforcement of the ratio requirement (though it also prohibited expenditure of federal funds in centers that allowed their staff/child ratios to fall below actual 1975 levels) and directed the Secretary of Health, Education and Welfare to prepare a report on the appropriateness of the FIDCR.

Both the 1968 FIDCR and the Title XX revision relied heavily on the opinions of child care and child development specialists – opinions based on experience and the best research data available. Available data, however, did not fully meet the needs of policymakers, for several reasons.

First, previous studies on the effects of child care tended to be narrow in scope. Few covered a wide variety of centers or tried to assess the impacts of a wide variety of center characteristics – such as staff/child ratio, group size and staff qualifications – thought to be critical in producing a healthy environment for young children. Most previous studies focused on only a small part of the day care environment. Many studies were performed in university or laboratory settings, or examined nursery school rather than full-day care. Few focused on children from family or socioeconomic backgrounds like those of most children affected by Title XX care – principally children from low-income families using publicly subsidized, work-related care in licensed facilities. Such studies could not and did not address the issue of whether particular center characteristics would be linked to similar outcomes for children across regions, states, cities, socioeconomic backgrounds and sponsoring agencies under Title XX legislation.

Second, very little previous research on day care costs has been systematic. Cost data were usually taken from whatever records were available. Studies generally lacked reliable cost assessment systems, comparable definitions of terms or representative sampling frames. Often they failed to take account of in-kind contributions. Even fewer previous efforts were designed to evaluate the quality or effects of programs relative to their costs. The few cost/quality studies focused primarily

In this report, as in other NDCS documents, "high" staff/child ratios mean fewer children per caregiver, while "low" staff/child ratios mean larger numbers of children per caregiver. Except where specifically noted, "staff" refers to classroom caregivers and not to non-caregivers such as administrators or support staff.

on "input" measures of quality, such as scope of services offered, or on "process" measures, such as caregiver attentiveness and responsiveness or classroom activity, but did not measure changes in children resulting from exposure to a specific day care environment.

The issue of what constitutes *quality* day care is a complex one, and the difficulty of defining quality is compounded by the diverse opinions held by parents, policymakers, providers and advocacy groups. Each group has a distinct philosophy about what day care should accomplish for children and their families. Some groups define quality in terms of the scope of services and activities provided for the children (educational, social, medical, nutritional, physical). Some are concerned with the climate of the day care classroom (caregiver behavior, caregiver stability, social structure, warm and stimulating interaction patterns, psychological health). Others define quality in terms of how the child changes as a result of her/his experience and the degree to which the environment promotes healthy development. Still others combine several or all of these factors in their description of quality day care.

Staff/child ratio, group size and caregiver qualifications have long been considered key determinants of quality in center care; all have been central factors in both state licensing requirements and federal fiscal regulations. Taken together, these regulatable center characteristics have been widely assumed to influence the nature and the number of contacts between caregiver and child and among children on a day-to-day basis within the day care center. It has been assumed that, within limits, a smaller number of children per caregiver lowers the risk of damage and increases the opportunity for successful stimulation of the child's cognitive, emotional and social development. It has also been assumed that an upper limit on group size is required both for safety and for the creation of a properly supportive environment for growth. Finally, it has been thought that a well-trained, experienced caregiver will, through her or his classroom behavior, produce positive outcomes for children while minimizing negative outcomes. In addition, many other regulatable and non-regulatable characteristics of centers have also been assumed to contribute to quality. Among these characteristics are the amount and type of space, materials and equipment; qualifications and skills of the director and of staff other than caregivers; the amount and nature of parent involvement; availability of supplementary services to children and families; center philosophy and educational programs.

The Administration for Children, Youth and Families (ACYF) recognized the need to test these assumptions through empirical research relating regulatable center characteristics to the quality and costs of care. ACYF initiated the National Day Care Study prior to the enactment of the Title XX FIDCR. As will become clear in the next section on the objectives and design of the study, the NDCS was not intended to address all aspects of the current FIDCR debate. Nevertheless, relevant preliminary data from this large-scale policy-oriented study have been made available to assist HEW in its evaluation of the appropriateness of the FIDCR.

THE NATIONAL DAY CARE STUDY OBJECTIVES AND DESIGN

The National Day Care Study is primarily concerned with center-based day care for preschool children. By far the largest number of subsidized children in licensed care are urban preschoolers attending centers. Nationally, centers enroll some 900,000 children – over two-thirds of whom are preschool age (ages three, four and five) and over half of whom live in major metropolitan areas. The NDCS does not address policy issues related to the care of school-age children, in-home and family day care, and the special needs of bilingual and handicapped children in day care settings, nor does it address the complex issues of health and nutrition of preschool children. Some of these issues, however, are addressed by other studies now in progress.

The Administration for Children, Youth and Families funded two research organizations to conduct the NDCS: Abt Associates Inc. of Cambridge, Massachusetts, and Stanford Research Institute of Menlo Park, California. Abt Associates has overall administrative and technical responsibility for the study, while Stanford Research Institute, as testing contractor, was responsible for selecting and

administering measures both of day care classroom processes and children's development.

The NDCS consists of a major Cost/Effects Study of center-based day care and two substudies: a Supply Study and an Infant Day Care Study. The cost/effects component focuses on the center environment of the preschool child, the quality of the child's experience and some of the consequences of that experience both for the child's development and for costs. Most of the preliminary findings presented in this report are based on data gathered for the Cost/Effects Study.

The Supply Study is a national telephone survey designed to collect information about enrollment, staffing, costs and other characteristics of centers. Unlike the Cost/Effects Study, the Supply Study is not limited to those centers primarily serving preschool children. It is based on a national probability sample of over 3,100 centers, stratified by state. The data provide a profile of available care, nationally and by state. This supporting study has been completed, and a separate published report of findings titled *Characteristics of Center-based Day Care in the United States: 1976-1977* will be available in March 1978. A summary of findings from the Supply Study begins on page 21.

Data from the Supply Study play an important role in the interpretation and generalization of the results of the cost/effects component of the NDCS. Using these data, the NDCS will be able to estimate the national implications of its effects and cost findings. The data will also be used to estimate the impact of alternative regulations, funding policies and monitoring practices on key center characteristics – staff/child ratio, group size, staff qualifications, number and characteristics of children enrolled, cost per child, salaries paid by centers, fees charged to parents, and the distribution of capacity between public and private, profit and nonprofit centers.

The second substudy of the NDCS is the Infant Day Care Study, a study of center day care arrangements for children under three. The Infant Day Care Study was initiated when staff/child ratios for infants and toddlers were included in the Title XX FIDCR. This effort was designed to provide policymakers with three kinds of data which were not previously available. First, centers caring for infants and toddlers were surveyed nationally to provide data about their distribution and characteristics (e.g., equipment, staff/child ratios, group sizes, program schedules and activities). Second, on-site interviews were conducted with center directors, caregivers and parents to gather more detailed data on these center characteristics, as well as opinions about infant and toddler care. Third, staff were observed as they cared for infants and toddlers. These first-hand data were used to develop a profile of caregiver behavior. Staff/child ratio and caregiver qualifications were of central concern in the Infant Day Care Study; center characteristics and caregiver behavior were examined in relation to these variables. The Infant Day Care Study will be published concurrently with the final NDCS report in July. A summary of preliminary findings from the Infant Study begins on page 18.

COST/EFFECTS STUDY DESIGN

The Cost/Effects Study of preschool center-based care was designed to answer the following major policy questions:

1. How is the development of preschool children in center day care affected by variation in staff/child ratio, number of classroom caregivers, group size, caregiver qualifications and other regulatable center characteristics?
2. How is the per-child cost of center day care affected by variation in staff/child ratio, number of classroom caregivers, group size, caregiver qualifications and other regulatable center characteristics?
3. How does the cost-effectiveness of center day care change when adjustments are made in staff/child ratio, number of classroom caregivers, group size, caregiver qualifications and other regulatable center characteristics?

The Cost/Effects Study was conducted in three phases. *Phase I,** from July 1974 to September

Phase I results are presented in the NDCS* **First Annual Report, *prepared by Abt Associates, and in a report entitled* **Phase II Instruments for the National Day Care Study,** *prepared by Stanford Research Institute and Abt Associates.*

1975, was a period of planning and implementation. The design of Phase II was developed and center selection criteria were formulated. Data collected through telephone interviews with licensed centers in 17 cities resulted in the selection of Atlanta, Detroit and Seattle as the study sites. A total of 64 centers at the three sites were subsequently selected for participation in Phase II.

*Phase II** was conducted from September 1975 through September 1976. The overall goal of Phase II was to build a substantive and methodological base for conducting Phase III, when definitive answers to the policy questions identified above could be provided.

In the absence of prior large-scale research on effects of variations in day care arrangements, it was not feasible at the outset of the study to design an experiment that took full account of the complexities of the day care world. Therefore, instead of proceeding directly from design and instrument development (Phase I) to the experimental study (Phase III), ACYF mandated an intervening descriptive phase in which center characteristics would not be altered but rather would be studied as they occurred naturally (Phase II). During this study phase, relationships among regulatable center characteristics, day-to-day behavior of children and caregivers, and developmental changes in children were explored, and hypotheses to be tested in Phase III were developed. All relationships discovered in Phase II required careful scrutiny before any could be accepted or rejected as definitive statements about the effects of federal policy on day care.

Analytic efforts in Phase II were devoted to refinement of data-gathering techniques, development of measures of daily behavior and developmental change, and statistical disentanglement of the complex relations among regulatable center characteristics, caregiver and child behavior and developmental outcomes which exist naturally in the day care world.

In addition, Phase II explored alternative ways of measuring the study's major policy variables – group size, number of classroom staff, staff/child ratio, caregiver education and experience. These explorations clarified measurement issues important to the study as well as to policymakers. Implications of these Phase II findings for refining both the language of future day care regulations and techniques for monitoring compliance are discussed in the NDCS *Second Annual Report;* final recommendations will appear in the NDCS final report.

Phase III, extending from October 1976 through July 1978, is designed to test hypotheses based on the results of Phase II and to answer definitively the study's three major policy questions. The design has two components: a 49-center quasi-experiment and an experiment being conducted in eight centers in the Atlanta Public Schools.

In the quasi-experiment, staff/child ratios were increased in 14 centers that had low ratios in Phase II (Group I). The effects of this treatment on caregivers and children were compared with those from a matched group of 14 untreated low-ratio centers (Group II) and with a group of 21 centers that had high ratios in Phase II (Group III). The Group I treatment simulates one potential effect of full enforcement of the FIDCR under Title XX – namely an increase in ratios in centers serving publicly funded children but operating below FIDCR ratios.

The Atlanta Public School (APS) Study is an eight-center, 29-classroom experiment in which children have been randomly assigned, within centers, to classrooms which differ systematically in level of staff education and staff/child ratio. Group size and caregiver experience were balanced in the design as far as feasible within existing enrollments, physical facilities and staff resources. This study makes possible a relatively clearcut assessment of the effects and interactions of staff education and staff/child ratio for children of different ages (three- and four-year-olds). Also, the existing homogeneity of both staff and child characteristics in the APS centers and the random assignment of children to classrooms permit a particularly clear separation of effects attributable to entering characteristics of the children from those due to center characteristics.

Phase II results and the Phase III design are presented in the NDCS* **Second Annual Report *(Cambridge, MA: Abt Associates, 1976).*

A major strength of the Cost/Effects Study is its use of two different designs to address the same policy questions. The quasi-experiment provides broad-based, generalizable data on the impact of regulatable center characteristics because it includes a large and diverse group of centers at three different sites. The APS Study provides a greater degree of experimental control. Thus the capacity of the NDCS to detect effects is enhanced by the number of centers in the quasi-experiment and by the more precise, experimentally created contrasts in the APS component. Consistent results from the two study components constitute a far sounder basis for policy conclusions than would results from either component alone.

COST/EFFECTS STUDY: SITE AND SAMPLE SELECTION

The study was conducted at three sites – Atlanta, Detroit and Seattle – in order to determine whether regulatable center characteristics have different costs or effects in different geographic, demographic and regulatory environments. A deliberate effort was made to enlist centers that varied widely not only in staff/child ratios, group size and staff qualifications but also in other characteristics. Centers were selected in which the range of regulated characteristics fell between levels incorporated in state licensing requirements and those required by the FIDCR. Centers were also selected to vary as much as possible in non-regulatable characteristics. For example, an effort was made to recruit centers that operated under a variety of auspices and drew their funds from different sources.

Diversity was also sought among the children and families served. Centers serving substantial numbers of both black and white children were selected, including integrated centers and those serving predominantly black or white groups of children. Similarly, centers were sought that served both low- and middle-income families and therefore included substantial numbers of children supported by public subsidy as well as children supported by parent fees. Preliminary results indicate that a significant proportion of the total day care center population and an even larger proportion of the policy-relevant day care market is represented in the NDCS sample.

COST EFFECTS STUDY: VARIABLES AND MEASURES

The principal independent variables of the NDCS – staff/child ratio, group size, caregiver qualifications and other regulatable center characteristics – were conceptually clear from the outset, although many technical problems had to be solved before they could be measured successfully. Much that is useful for regulation and monitoring was learned in the process of developing adequate measures. Dependent cost variables were also conceptually clear. In contrast, for reasons already indicated, dependent variables associated with quality or effects were not clear at the start; the meaning of the study's effects measures evolved as the study progressed and as more and more was learned about the instruments initially selected to measure effects.

Independent Variables and Measures

Independent variables were of two types: *policy* variables, or center characteristics subject to regulatory control, and *background* variables, such as age, sex and race of children, and socioeconomic characteristics of families and of the community served by the particular center. Background variables can be influenced by regulation only indirectly if at all, yet their measurement and analysis is essential to a full understanding of the effects of the policy variables.

The major policy variables discussed in this report were defined as follows:

- *Number of caregivers* – the total number of caregivers assigned to each classroom or group.*
- *Group size* – the total number of children assigned to a class or a principally responsible caregiver.

**In most cases the term "group" refers to the number of children in a classroom. However, in a few centers organized in an "open classroom" pattern, there were several clusters of children and caregivers in a single large space. The NDCS treated each of these clusters as a separate group. Current analyses seem to indicate that results in such situations are similar to those obtained for small groups in separate classrooms.*

- *Staff/child ratio* – number of caregivers divided by group size.
- *Caregiver qualifications* – total years of formal education, presence or absence of specialized preparation related to child care, and day care experience (both prior to current job and time in current center).*

Measures of these policy variables were chose according to three criteria: reliability, validity and potential utility in monitoring and regulating. Information on caregiver qualifications was gathered from interviews with caregivers. Information on variables related to classroom composition (number of caregivers, group size, ratio) was gathered by two methods, one based on schedule or roster data and the other on direct observation.

Among the most important results of Phase II were findings about different measures of group composition. Very different values of staff/child ratio could be calculated for exactly the same real situation, depending on the formula used for calculation. Observed values of all three classroom composition variables fluctuated appreciably over the day and slightly over the year, also varying with activities, presence or absence of volunteers and attendance of children and staff.** Observed group sizes were generally smaller than scheduled ones, and observed staff/child ratios were higher (fewer children per caregiver) than scheduled ratios, principally because of child absences.

The implication of these findings for monitoring and regulation is that some flexibility must be used in applying group size and/or ratio standards. While the standards themselves must be specific, centers should be allowed minor variations at a given moment. For example, group sizes at lunch and nap times are often large, and ratios are usually low during nap, as staff take the opportunity for a break in their routine. This sort of variation within the center does not appear to affect children, as long as required group sizes and ratios are maintained during the major portion of the day.

Phase II findings also had implications for NDCS research decisions. It was necessary to choose measures of classroom composition that were reliable enough for quantitative analysis and likely to show maximum impact on the behavior of caregivers and children. For these reasons, observation-based measures were taken at many time points over the day and year. Because the measures were based on observation, they reflected classroom reality more directly than did schedules. Moreover, because they were averaged over many time points, they proved to be stable, reliable descriptors of centers. About 95 percent of the variation in these measures was linked to true center-to-center differences, and only 5 percent to fluctuation and error.

As intended when the study was designed, levels of the policy variables in the NDCS sample spanned a wide range. Most centers in the sample maintained observed staff/child ratios between 1:5 and 1:10 for three- and four-year-olds. (Observed ratios in this range correspond roughly to scheduled ratios of 1:6-1:11.) Licensing requirements for 35 states mandate ratios of at least 1:10 or higher, and 60 percent of centers nationally maintain ratios in this range.§ Most NDCS centers maintained group sizes between 10 and 20; over half of the centers in the country maintain group sizes in this range. The sample also included several centers with staff/child ratios between 1:10 and 1:20, and with group sizes as large as 30. About 70 percent of centers in the country maintain ratios within the total range of the NDCS sample, while 90 percent maintain group sizes from 10 to 30 for preschool children.

Information on background characteristics of children and their families was gathered through interviews with over 1,100 parents. Background information included family income, sources of income, parents' education and occupation, length of parents' employment, number of siblings and number of

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**The NDCS also collected data on various forms of training offered by the study centers. These data will be analyzed in the future and discussed in the study's final report.*

***For a detailed discussion of measures of classroom composition, see the NDCS* **Second Annual Report** *(Cambridge, MA: Abt Associates, 1977), Chapter 2.*

§ National figures are based on the NDCS Supply Study.

adults living in the house. Age, sex and race of child were verified. In addition, census data were used to provide background information on demographic characteristics of the community, chiefly its socioeconomic and racial composition.

A great deal of additional information on center characteristics, attitudes and backgrounds of directors and caregivers, and attitudes and behavior of parents was gathered through interviews and observation. Analyses based on the additional data are still to be performed; these analyses are described briefly in a later section.

Dependent Variables and Measures

Selection of dependent variables and measures is closely linked to the definition of quality. However, as indicated earlier, definitions of quality vary, and the research literature offers no clear guidance as to how quality should be measured.

The NDCS gathered a broad range of information relevant to many different definitions of quality. Day-to-day behaviors of children and caregivers were observed in considerable detail. The resulting records were not used to form judgments about individuals, but about the dynamics of different classrooms.* No value judgment was placed on any particular behavior in isolation. Rather, an effort was made to identify *patterns* of behavior that, taken as wholes, could be reasonably judged as developmentally beneficial for children.

For example, one item of information collected was the frequency with which children gave opinions. This information was not used to characterize individual children as shy or opinionated, nor was a high frequency of opinion-giving prejudged to be a good or bad sign for the classroom as a whole. (Clearly, there can be too much or too little opinion-giving, and there is no way to specify how much is optimal.) Rather, as explained later in more detail, opinion-giving was one of many behaviors that formed a pattern related to group size and other regulatable center characteristics. A positive value judgment was placed on the pattern as a whole, but not on opinion-giving alone.

A similar approach was taken in using caregiver observation data as indicators of classroom quality. No attempt was made to place value judgments on isolated caregiver behaviors, such as praising children, correcting children or watching children. Caregiver behaviors such as these were evaluated as part of a total classroom pattern.

In addition to the observational measures, standardized tests of selected school readiness skills were administered to children. Gains in test scores over the six-month period in which the child attended the center were the dependent measures of interest.** Again, however, test score gains were not taken in isolation as measures of quality. While there is general agreement that higher gains are better than lower gains, there is far less agreement about the breadth of school readiness skills captured by such tests. Thus test scores also were evaluated as part of an overall picture that included behavioral measures as well.

As shown later, one of the most striking preliminary findings of the NDCS is that the many different dependent measures converge. It was possible to find classrooms that seemed to be better or worse for children on a variety of dimensions and, moreover, to link these variations in quality to regulatable center characteristics.

Adult Variables and Instruments: The system selected for observing caregivers and the classroom environment – the Adult-Focus Instrument – had been used previously by Stanford Research Institute in evaluating the Follow Through and Head Start Planned Variation projects. The system was modified for the NDCS to record adult behavior in day care centers.

The Adult-Focus Instrument includes a Physical Environment Inventory, which describes space,

**Children were observed individually, but all child observations in a given classroom were averaged to develop a general behavioral profile of that classroom. All analyses reported here are based on these class averages.*

***Calculations of these gain scores involved certain technical adjustments which are discussed futher on page 13.*

materials and equipment in the classroom; a Classroom Snapshot, which describes general activity patterns at a point in time; and a Five-Minute Interaction record, which describes the behavior of a particular caregiver in detail. The Five-Minute Interaction data are of primary interest here.

The instrument categorizes caregiver behavior in terms of codes that are fairly self-explanatory (e.g., "commands," "corrects," "instructs"). It also records whether the caregiver's behavior was directed to a single child, a small group (defined as 2-7 children), a medium to large group (defined as 8 or more children) or to other adults. In current analyses these behavioral records have been grouped into broader categories, as follows:

- *Interaction* with children comprising:

  management activities (commanding and correcting), and

  social interaction (questioning, responding, instructing, praising and comforting)
- *Observing* children
- *Interaction with adults*

Other data on caregiver behavior and attitudes were collected by a second observation instrument, based on the caregiver competence areas specified in the Child Development Associate certification system, and by a rating scale called the Day Care Forces Inventory. These instruments are described in a later section on future analyses.

Child Variables and Instruments: The system selected for observing children in the classroom environment – The Child-Focus Observation Instrument – was modified from a system used in a study of day care by Elizabeth Prescott and her colleagues. The instrument provided a fairly fine-grained description of child behavior in the day care setting. Observers coded child behavior in three areas: the degree to which the child was involved in group activities and the nature of those activities; the degree to which the child initiated interchange with other children and how she/he did so; the degree to which the child received input from others, the nature of the input and the child's reaction to it. Examples of the 54 behavior codes included in the instrument are: "considers, contemplates;" "offers to help or share;" "cries;" "asks for comfort;" "refuses to comply". Observers also coded the object of the child's attention (environment, other child, group of children, or adult) and the duration of the child's activities.

In addition to observations, measures of aspects of school readiness were obtained by the NDCS. Given the difficulty of finding instruments that assess the broad range of skills connoted by the term "school readiness," the NDCS reviewed the literature and field-tested several instruments before settling on the Preschool Inventory (PSI) and the modified Peabody Picture Vocabulary Test (PPVT) as tests providing a sample of items associated with important aspects of school readiness. The PPVT is principally a measure of vocabulary. The PSI is designed to measure a range of skills including the child's knowledge of colors, shapes, sizes and spatial relationships (e.g., the child's ability to use prepositions such as "under," "over," "in"). In the Head Start Longitudinal Study, conducted by the Educational Testing Service, children's PSI scores, measured before any child entered a preschool program, were significant predictors of children's achievement scores on third-grade tests of math and reading, as well as on the Raven Colored Progressive Matrices, a measure of perceptual problem-solving ability.*

Research Cost Accounting System (RCAS): The RCAS was designed to collect monthly financial data from each center according to standardized accounting categories of income and expenditures. The core of the data collection system is a Statement of Current Income and Expense, used to record cash income and in-kind donations as well as cash and imputed expenses. Four categories of income were recorded – parent fees, government payments, gifts and contributions, and other income. Expenditures also fell into four categories – personnel, supplies, occupancy costs and other expenses.

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*See Virginia Shipman, J. David McKee and Brent Bridgeman, "Stability and Change in Family Status, Situational and Process Variables and Their Relationship to Children's Cognitive Performance," **Disadvantaged Children and Their First School Experiences, ETS-Head Start Longitudinal Study** (Princeton, NJ: Educational Testing Service, 1976).*

To minimize the reporting burden imposed on centers and to ensure reliability of recorded information, data collection forms were tailored to the financial recordkeeping systems of individual centers. However, data were reclassified into the standardized income and expenditure categories listed above. The procedures ensured that data within each category would be comparable across centers.

COST/EFFECTS STUDY: FUTURE ANALYSES

Although the NDCS was not specifically intended to examine the appropriateness of the FIDCR, data from the study are relevant both for HEW staff charged with preparing the report on the appropriateness of the current regulations and for those responsible for formulating new or revised federal regulations. Because the NDCS is not scheduled for completion until July 1978, analyses of the data gathered during this four-year study are not yet completed. However, in recognition of the need for data bearing on the appropriateness of current regulations, analyses of NDCS data were organized into two stages.

The first stage explored the relationship between the major NDCS policy variables — staff/child ratio, number of caregivers per group, group size, and staff qualifications — and caregiver behaviors, child behaviors, and children's test score gains. Findings based on these analyses, although preliminary in nature, permit conclusions to be drawn regarding a *general direction* for regulations of the policy variables. These preliminary findings are the basis for this report and are presented in greater detail in the sections that follow.

The second stage of analysis is still underway. Its purpose is to provide precise information to aid those responsible for formulating new or revised regulations. During this stage, ranges for each of the major policy variables that are most clearly associated with quality will be established. For instance, the impact of various types and amounts of staff education and experience will be examined. Such analyses will help in refining FIDCR specifications regarding staff qualifications.

The relationship between various center and caregiver characteristics and the rate of occurrence of rare but critical events, such as physical punishment or accidents, will be explored. These critical incidents may be the study's best indicators of harm in day care. This analysis will address the question of how regulations can be formulated so that harmful experiences for children can be minimized. Knowledge about relationships between regulated center characteristics and harm indicators is crucial to establishing specific regulatory levels for the number of staff and children assigned to groups.

A detailed analysis of links among caregiver behavior, child behavior and child test scores will also be completed. This picture of caregiver performance and the relationships of performance to child outcomes will be further rounded out in the second stage of analysis with data from two additional instruments mentioned earlier — the Child Development Associate (CDA) checklist and the Day Care Forces Inventory (DCFI). The CDA checklist is an observation instrument developed by SRI to record caregiver behavior relevant to the categories of competence specified in the CDA certification system. Preliminary analyses of the CDA checklist data indicate that the competence areas specified in it appear as well-defined, coherent "clusters" of caregiver behavior. Thus this instrument provides an independent view of caregiver competence that can be used to cross-validate and expand the picture of center process that emerges from the adult-focus and child-focus observation data. The DCFI measures the caregiver's perception of the impact various center characteristics have on her/his job. As such, it is an important adjunct to behavioral observations and testing.

Investigation of regulatable center characteristics other than the major policy variables has been part of the NDCS mandate from the study's inception. The following variables emerged from Phase I as potentially regulatable center characteristics:

- physical facilities (space, materials and equipment)
- availability of specialists and services
- availability of opportunities for parent involvement
- aspects of center philosophy and program orientation

- stability of caregiver/child relationships
- director qualifications

Data on these center characteristics were collected by observation and interviews with staff and directors in Phases II and III. The characteristics are being investigated both as possible independent contributors to center effects and as factors that may condition the effects of the major policy variables. Results of these analyses will suggest other possible elements for regulatory consideration.

Parent involvement is considered an important component of center process, and parent satisfaction is an important outcome of day care. A determination will be made during the second stage of analysis about those center characteristics which are associated most clearly with parent involvement and satisfaction.

Test data are available for a subset of 110 children over a 20-month period (Phases II and III). These longitudinal data will provide a much more complete picture of the developmental patterns associated with the test scores and a chance to assess the effects of day care over a much longer period than the six-month fall-to-spring changes in either Phase II or Phase III. Also, because data on parental attitudes and child-rearing practices are available for children in the longitudinal sample, it will be possible to examine interactions between the home environment and characteristics of the day care setting for this subgroup.

Effects associated with alternative measures of the major policy variables will be explored during the second stage of analysis. As discussed above, in Phase II the NDCS devoted considerable effort to developing a highly reliable, observation-based system for measuring numbers of caregivers, group size and staff/ratio. Such a system is costly and not practical for regulatory and monitoring purposes. Selected effects analyses will be re-run using measures that are more realistic for regulatory purposes.

Future analyses will also amplify NDCS cost findings. Currently the costs associated with variations in the major policy variables have been identified. For example, the cost impact of raising staff/child ratio can be estimated if the levels of the other variables are not changed. Such analyses do not allow prediction of all the cost implications associated with changes in ratio. For instance, if centers were required to increase their staffs, they might respond by hiring less educated (and therefore less expensive) caregivers. Additional analyses drawing on both RCAS and Supply Study data will attempt to deal with the cost impacts of reactions or compensations to changes in levels of the policy variables.

Understanding the cost/quality trade-offs of varying federal regulations is essential to the NDCS and to the formulation of specific day care regulations. Cost data from the NDCS Supply Study are available and linkages between those data and NDCS cost/effects data will be examined in the final stage of analysis.

Finally, as indicated earlier, a significant strength of the NDCS is that it incorporates several partially independent investigations of the same policy questions. Comparisons of results from Phases II and III and from the 49-center quasi-experiment and eight-center Atlanta Public Schools study are underway. Convergent results will greatly enhance the credibility of all conclusions. However, if results diverge, the inconsistencies will have to be resolved before regulatory conclusions can be reached. This process cannot be completed until a reasonably full picture of results from the component studies has emerged.

All of the analyses outlined in the foregoing paragraphs will help to build a fuller understanding of the ways in which regulatable center characteristics affect the quality of care for children. The analyses will aid in the formulation of precise regulatory language and in the selection of specific regulatory levels for those center characteristics found to be most effective in controlling the quality of care. Analyses already performed have identified some key center characteristics and have indicated the general directions in which regulations should go. Results of these early analyses are presented in the remainder of this report.

COST/EFFECTS STUDY: PRELIMINARY EFFECTS FINDINGS

Patterns have begun to emerge, in broad outline, from effects analyses completed by January 1978. Until the further analyses identified above are performed, some caution must be exercised when policy and regulatory implications are drawn. Nevertheless, there is sufficient consistency in the emerging picture to warrant preliminary interpretation.

In brief, the data provide clear evidence that the composition of the day care classroom – the number of caregivers and the number of children grouped together – is linked both to day-to-day behavior of children and caregivers and to children's gains on the PSI and PPVT. Control of group size and number of caregivers appears to be a potentially effective way to promote quality in center care.* Moreover, there is evidence that certain aspects of caregiver qualifications also are related to caregiver behavior and children's test scores. The data indicate that specifications regarding caregiver preparation more precise than those embodied in either current federal regulations or state licensing requirements may increase the likelihood of positive outcomes in day care. These broad conclusions are amplified and supported in the remainder of this section.

Center-to-Center Differences

Before turning to specific findings, it is useful to ask what impact regulation might reasonably be expected to have on caregivers and children, and also to ask what kinds of results might reasonably be expected from any large-scale study of the effects of variations in child care programs. The word "variations" is critical here. The National Day Care Study addresses the effects not of day care per se but of *differences* in day care programs, particularly the differential effects of center characteristics that are or can be controlled by state and federal regulation.

Previous national evaluations of outcomes associated with different levels of resource outlay in education, or with program variations within early intervention projects, give some indication of what to expect, although no previous study is precisely analogous to the NDCS in purpose, scope and method. Such studies have typically shown that measured effects of variations in programs or resources are small. Often effects due to program differences cannot be detected at all. This situation can arise for any of several reasons. First, available outcome measures may lack the breadth or sensitivity needed to detect effects of variations in programs or resources. Second, program differences may be poorly defined, implemented or measured. Finally, *differences* in outcomes may be genuinely small relative to the effects of the program per se (e.g., of school itself, or of early intervention itself) and relative to other factors, such as the socioeconomic backgrounds of the children served.

Thus, earlier studies might lead one to expect that center characteristics controlled or controllable by regulation may play a somewhat limited role in determining the quality of care, defined in terms of daily interactions and developmental changes in children. Moreover, previous findings caution that such effects may be difficult to measure even when they do exist.

On the other hand, the NDCS had advantages over previous studies. The independent variables of the NDCS, particularly those relating to classroom composition (number of children and number of caregivers) were defined clearly and measured precisely. In addition, the study's dependent variables included observational measures of an unusually broad range of child and caregiver behaviors, as well as test scores. Therefore the chances of finding effects in this study were significantly greater than in studies that used narrow sets of outcome measures, or that focused on effects of programs that may have differed less in reality than in theory.

Against this backdrop of previous research, the first major finding of the NDCS is that day care centers in fact differ measurably and systematically in patterns of caregiver and child behavior and in child test score gains. Not surprisingly, variations from child to child

Whether control should be exercised through regulation and whether regulations should be set at the federal or state level are separate issues not addressed by this study.

within centers are far larger than differences between centers in average behavior patterns or average test score gains. That is, differences linked to individual children and their home environments outweigh those linked to centers. Nevertheless, variation associated with the center is quite significant, in both a statistical and a practical sense.

Statistical analyses were conducted to establish the precise magnitude of center-to-center differences for PSI and PPVT gain score measures. Results for the two measures were virtually identical. In the case of the PSI, children in different centers showed differences in rates of gain equivalent to one to two months of normal growth over a five- to six-month period – a difference in rate of growth that is potentially of educational significance.* Similarly precise calculations of overall center-to-center differences have not yet been performed for the observational measures of behavior; however, the existence of such differences is clearly implied by other data reported below.

Differences Associated with Regulatable Center Characteristics

Once it is established that there are significant differences in effects from center to center, the question arises whether these differences are associated with center characteristics that are the subject of federal regulation. Again, NDCS results give an affirmative answer. A substantial portion of the center-to-center variation in both test scores and behavioral measures is associated with two clusters of center characteristics that fall under current regulation. The first of these clusters relates to classroom composition and the second to caregiver qualifications. Each cluster is discussed in a separate section below.

It should also be recalled that future NDCS analyses will address other potentially regulatable center characteristics, including, but not limited to, physical facilities, center philosophy and stability of caregiving arrangements.

Thus there is a possibility that the fraction of center-to-center variation potentially susceptible to regulatory control may actually exceed current estimates and that other effective regulatory variables will be discovered as the analysis proceeds.

The findings reported in the following two sections have been subjected to extensive methodological scrutiny. Potential statistical pitfalls have been examined and shown not to threaten the findings. In particular, the basic results hold when various alternative combinations of independent variables are used in analyses. They hold when different units of analysis – child, class or center – are used. They are not attributable to extreme, atypical cases (except possibly in one instance noted later). The reliabilities of most of the independent and dependent measures are known and are adequate to allow detection of most effects of practical importance. Finally, attrition, or change in the composition of the sample of children from fall to spring, does not account for the results obtained.

Classroom Composition

NDCS results indicate that positive outcomes** are associated with small classroom groupings, defined in terms of both numbers of children and numbers of caregivers. However, study results at present do not permit precise specification of group sizes, numbers of caregivers, and resulting staff/child ratios that are linked to optimum benefits for children, nor do they permit judgment about whether these classroom parameters should be different for three- and four-year-olds. Future analyses will help to specify optimal ranges and configurations for these center characteristics and to assess whether these ranges are age-specific. At this point, it is clear that groups of 15 or fewer children, with correspondingly small numbers of caregivers, are associated with higher frequencies of desirable child and caregiver behavior and higher gains on the PSI and PPVT than groups of 25 or more children. However, it is not possible at this stage

As indicated earlier, PSI scores are known to be associated with achievement in elementary school. Whether gains in the rate of PSI growth due to particular day care experiences are also associated with gains in elementary school achievement is not known.

**As indicated in the earlier discussion of quality in day care, universal agreement about which outcomes are "positive" does not exist. The rationale for making this value judgment is presented in a later section on the policy implications of the preliminary findings.

of analysis to pinpoint a clear ceiling within this range that could serve as an empirically based standard for regulation. Future analyses will narrow the acceptable ranges for both group size and numbers of caregivers.

The benefits of small groups were observed even when caregiver/child ratios were constant within the policy-relevant range included in this study. For example, groups of 12-14 children with two caregivers had, on the average, better outcomes than groups of 24-28 children with four caregivers. These results make it clear that staff/child ratio cannot by itself be the principal mechanism for guaranteeing benefits to children, although it may be an important indicator of staff burden.

Caregiver Behavior: Lead teachers in smaller groups engaged in more social interaction with children (questioning, responding, instructing, praising and comforting) than did teachers in larger groups. In contrast, teachers in larger groups spent more time observing children and interacting with other adults than did teachers in smaller groups. The effects of staff/child ratio were minor when compared with those of group size. Caregivers tended to interact more with children when ratios were low, i.e., when there were more children per caregiver. However, the additional interaction primarily took the form of management behavior, e.g., commanding and correcting.

Child Behavior: Children in smaller groups showed higher frequencies of such behaviors as considering/contemplating, contributing ideas, giving opinions, persisting at tasks and cooperating than did children in large groups. In general, smaller groups were characterized by high levels of interest and participation on the part of children. In large groups, children showed higher frequencies of wandering, noninvolvement, apathy and withdrawal. Regardless of group size, small variations in staff/child ratio showed no systematic relationships to child behavior.

PSI and PPVT Gains: As indicated earlier, the NDCS cognitive effects analysis has focused on children's fall-to-spring gains on the PSI and PPVT. The gain scores used in the analysis were not simple differences of spring and fall scores, but adjusted values calculated so as to avoid well-known technical problems with simple difference scores.* These adjusted gain scores were found to have an extremely important property: they were not dependent on the child's age, sex, race, family income, mother's education and other socioeconomic background characteristics.** They seemed to be affected primarily by variations in the individual child's environment that were independent of these socioeconomic and demographic factors — e.g., variations in children's home environments and in the day care centers they attended. This property was important because it removed any need to perform further statistical adjustments to compensate for effects of socioeconomic and demographic background variables. (Such adjustments are controversial and best avoided when possible.)

Children's gains on the PSI and PPVT were higher in centers that maintained smaller groups of caregivers and children than in centers with larger groups. High staff/child ratios by themselves were not associated with high gains on these tests in the 49-center quasi-experiment. No effect of ratio was observed across all 49 centers together, and none was observed when "treated" centers with ratios averaging 1:6[§] were compared with

*A preliminary discussion of the adjustment technique was provided by Robert Goodrich in Appendix A of the NDCS **Phase II Research Report** (Cambridge, MA: Abt Associates, 1977); a full treatment will be given in a forthcoming technical memo by the same author.*

***As expected from the results of other studies, there was a slight influence of race on PPVT gain scores. However, the effect was so small as to have virtually no effect on policy analyses. Scores were nevertheless statistically adjusted prior to analysis to remove the minor difference associated with race.*

[§]*All figures shown in this paragraph refer to* **observed** *average ratios in the designated groups of centers or classrooms. As noted earlier, observed ratios fluctuate over time and are generally higher than scheduled contact-hour ratios. Observed ratios in both the quasi-experiment and Atlanta Public School experiment were therefore expected to be, and were, somewhat different from the scheduled ratios established by contract between the centers and the NDCS. These scheduled ratios were previously reported as elements of the study design in the NDCS* **Second Annual Report.**

matched, untreated centers with ratios averaging 1:9. However, in the Atlanta Public School study, where children were assigned randomly to classes with contrasting high (1:5.5) and low (1:7.8) ratios, there was some association between high ratios and high PSI gains. This association was much weaker than that between group size and PSI gains in the APS study; moreover, no link between ratio and PPVT gains was found.

While the links between group size and test score gains are well established, further analyses are necessary to determine how and why group size works as it does. For example, it may be the case (and it is consistent with the data) that educational activities are relatively ineffective in large groups because children are allowed to "tune out," with eventual ill effects on their gain scores. But it is also possible that educational activities simply take place less frequently in large groups; caregivers may not try to teach children when they have large numbers to contend with. Detailed exploration of the connections among classroom composition variables, activity patterns and gain scores may help to explain the effects of the composition variables in a way that will be credible to day care practitioners.

Caregiver Qualifications

Thus far the NDCS has examined the correlates of four components of caregiver qualifications: (1) years of formal education (regardless of subject matter or specialization); (2) presence or absence of specialization in subject matter related to children and child care; (3) amount of day care work experience prior to the caregiver's beginning work at her/his current center; and (4) length of service in current center. The results can be summarized as follows.

First, years of formal education by itself, independent of child-related educational content, had no detectable relation to child behavior or test scores. It showed only a few weak relationships to caregiver behavior.

Second, previous day care experience showed signs of relationships to test scores and caregiver behavior. Previous experience appeared to have correlates different from those of length of service in current center. However, results regarding experience cannot be regarded as conclusive at this time because the results from the 49-center study may be due to a few extreme, atypical centers, and there were some anomalous outcomes in the Atlanta Public School study. Therefore, caregiver experience is not discussed further here, pending the results of further investigation.

Finally, caregiver specialization in child-related fields such as developmental psychology, early childhood education or special education was associated with distinctive patterns of caregiver behavior and with higher gains in test scores for children. Results on specialization are elaborated below for each of the major classes of dependent variables – caregiver behavior, child behavior, and PSI and PPVT gain scores. However, these results must be interpreted carefully, for the following reason. Many caregivers in the sample who had specialized in a child-related area did so in the context of a program of postsecondary education. Some, however, received their training in the context of a high school program, and a number of caregivers in Atlanta took a state-required 60-hour training course after high school but outside of any formal degree program. It is obviously important for policymakers to know whether specialization is effective for individuals with relatively little formal education and to know what type of specialization and training is most effective. To address these issues, and to understand the meaning of specialization more fully, it is necessary to perform more detailed analyses than have been completed to date.

The results reported below are based on the 49-center study and on all 57 Phase III centers taken as a group. Within the Atlanta Public School (APS) study, effects of the presence or absence of specialization could not be investigated because the vast majority of caregivers in that study have specialized in a child-related area either formally or by taking the state-required course. However, in the Atlanta Public School study, specialization can be contrasted on three levels – the 60-hour state-required course, a local two-year postsecondary vocational program in day care, and graduate education. Further comparison of APS caregivers across these widely varying yet well-

defined levels and kinds of education will help clarify the meaning and consequences of specialization.

Caregiver Behavior: In the 49-center study, caregivers who had specialized in child-related fields engaged in more social interaction with children (questioning, responding, instructing, praising and comforting) and spent less time than other caregivers in interaction with other adults. There was also some tendency for those caregivers to engage in less management behavior (i.e., commanding and correcting) than other caregivers.

Child Behavior: Preliminary analyses showed virtually no systematic effects of caregiver qualifications on any of the child observation variables. However, analysis of the child-focus data is continuing, and it is too soon to declare that such effects are absent.

One important ongoing analysis attempts to link caregiver behavior to child behaviors. It is likely that child behaviors are more directly linked to caregiver *behaviors* than to caregiver *qualifications,* which are associated with but do not fully determine caregiver behaviors. If this plausible proposition proves true, it will help to explain the apparent absence of an association between caregiver qualifications and child behavior. More important, it will help to specify further the behavioral characteristics of effective caregivers.

PSI and PPVT Gains: Caregiver specialization in child-related fields was associated with higher gains on the PSI for children in the 49-center quasi-experiment and for children in all 57 Phase III centers, analyzed as a single group. Specialization had a weak positive relationship to PPVT gains for all 57 centers.

Interactions of Structure and Qualifications

An important issue to consider in framing child care regulations is whether optimum group structures and optimum caregiver qualifications can be specified independently, or whether they are mutually contingent. For example, consider whether the optimum group size is the same for caregivers with and without specialization in a child-related field. Both of these variables, taken separately, contribute to quality in child care. It might be the case that caregivers with specialized education or training can effectively handle groups of widely varying sizes, while less qualified caregivers are effective only with smaller groups. (Such a situation would appear in the data as a statistical interaction effect involving specialization and group size.) Alternatively, it might be the case that *all* caregivers, with and without specialization, are more effective with smaller groups, and that caregivers with specialization are more effective than others with groups of any size. This, in fact, is the case in the NDCS. Phase III data show no hint of an interaction between specialization and group size – the strongest qualifications and structure variables to emerge thus far. (It is unlikely, though conceivable, that interactions might emerge for other qualifications and structure variables in the future.)

Policy Implications of Effects Findings

The implications drawn here are based on the assumption that fairly clear positive value can be placed on the pattern of outcomes found in the NDCS to be associated with small group sizes and with staff specialization in child-related fields. Most parents, day care providers, child advocates, developmental psychologists and policymakers would agree that it is good for caregivers to interact with children in the ways described earlier, good for children to show interest and participation in center activities, and good for children to make higher gains on tests. Admittedly, there is room for a great deal of disagreement about how important these different elements are for quality in child care, or about how much of a particular behavior is good. It is questionable whether sound policy recommendations could be based on any one or two of the study's dependent variables in isolation, and it is hard to see how any recommendations could be reached if these indicators pointed in different directions (e.g., some suggesting that large groups are beneficial, and others suggesting that small groups are associated with higher quality). However, the consistency of results that have actually emerged in the study across different instruments and areas of measurement thus far allows unambiguous conclusions about which regulatable characteristics of centers are the best predictors of quality for a child.

In light of the convergence of effects and the value that can be placed on the pattern of effects that emerged in the study, the following policy conclusions appear to be warranted:

First and most fundamentally, any regulatory strategy designed to ensure maximum developmental benefits for children should specify allowable numbers of children and caregivers in each classroom group, and should also require that at least one caregiver per classroom have specialized preparation in a child-related field. To achieve maximum effects, regulations cannot focus on any one component of group composition, caregiver qualifications, or any other factor that may be found important for quality of care, *in isolation.* Every day care classroom has one or more caregivers at some level(s) of qualifications and a group composition that can be described in terms of any two of three elements — number of caregivers, number of children (group size), and the resulting staff/child ratio.* To be effective, regulations should specify *configurations* of children and caregivers, with minimum qualifications defined for at least one caregiver.

Second, although staff/child ratio regulations have been the focus of most public attention and controversy, clear findings on the importance of group size suggest a shift in emphasis toward this more easily understood and measured factor. This shift in emphasis does not mean that ratio requirements can be omitted from future versions of state and federal regulations, but rather that ratio should be seen as the outcome of setting limits on the number of children and caregivers in the classroom and not as the principal means of ensuring quality. There is little indication that NDCS results will lead to recommendations more stringent than the current FIDCR ratio requirements. On the contrary, current findings appear to indicate that ratios slightly above or below those permitted by the present FIDCR can be consistent with positive day care environments for children if group size limits are appropriately set.

Third, even in effective centers, group sizes and staff/child ratios vary by time of day, type of activity, season of the year and often by children's ages. Therefore, while the standards themselves must be specific, regulatory codes and monitoring practices should be designed to take this dynamic aspect of center care into account.

Fourth, and finally, because no major differences in effects from site to site have emerged so far, the study offers no evidence that the key FIDCR components should not be included in a single set of nationally applicable standards.

COST/EFFECTS STUDY: PRELIMINARY COST FINDINGS

The primary focus of the NDCS financial analysis was to determine how the per-child cost of center-based day care is affected by variations in staff/child ratio, group size, staff qualifications and other regulatable center characteristics. Detailed financial data were collected monthly from each of the participating study centers. The data reflect *resource use rather than cash outlay,* meaning that the cash value of donated goods and services and an estimate of depreciation were included in the income and expense figures.

In order to ensure the reliability of financial data used in the cost analysis, these data and the instrument used to collect them were reviewed by an independent accounting firm. This review concluded that the NDCS Research Cost Accounting System (RCAS)** provides reliable financial representations of the day care centers included in the study.

The RCAS was designed to predict changes in the financial status of day care centers (e.g., cost per child) which would result from an actual change in regulatable center characteristics. Data from the Supply Study will be used to forecast the changes in centers which are likely to occur as a result of changes in government day care regulations, monitoring procedures and reimbursement policies. The combination of RCAS and Supply Study forecasting models will complete the link

**When any two of these elements are specified, the third is fixed mathematically.*

***Further description and discussion of the RCAS can be found in the NDCS* **First Annual Report** *(Cambridge, MA: Abt Associates, 1976) and the NDCS* **Second Annual Report** *(Cambridge, MA: Abt Associates, 1977).*

between policy and administrative decisions, on the one hand, and changes in the characteristics and costs of center care on the other hand. Combined with NDCS findings on effects of variations in center characteristics on the safety and development of children, the complete financial model will provide the basis for the cost-effectiveness analysis to be included in the NDCS final report.

The present report reviews the financial characteristics of the Cost/Effects Study centers, reports on the cost impact of key regulatable center characteristics – staff/child ratio, group size and staff qualifications – and discusses differences in costs between federally funded and privately funded centers.

Summary of Financial Characteristics

In the 57 Phase III centers, average monthly resource cost per full-time-equivalent (FTE) child was about $161.* There was, however, considerable variation across centers, with resource cost per child ranging from a low of $80 per month to a high of $310 per month. Not surprisingly, personnel expenses accounted for the bulk of center expenses. Centers spent an average $107 monthly per child, or about two out of every three dollars spent per month, on personnel. Fourteen percent of monthly expenses ($22 per child) was spent for occupancy, and the remaining 19 percent ($32 per child) was spent for supplies, equipment and other operating costs.

Average monthly resource income was about $165 per child in the study centers. Excluding gifts and contributions, the NDCS centers were almost evenly divided on the basis of primary sources of income. Slightly more than half of the centers were dependent on parent fees as their primary source of income, while the rest depended primarily on government payments.

*Figures on cost per child reported here differ from those published earlier in the NDCS **Second Annual Report.** The present figures incorporate a correction in the number of FTE children used to calculate per-child cost. The earlier report used 30 hours per week as the standard for an FTE child. Subsequent analyses indicated that the standard should be 40 hours per week. It should be noted that while the change in the FTE standard increased cost per FTE child, the change does not affect cost per child-hour.*

Cost Analyses

Statistical analyses showed that three factors – the ratio of caregivers to children, the ratio of non-caregiving staff to children, and average center wage rates – account for nearly three-quarters of the observed variation across centers in cost per child. This result is not at all surprising in light of the large proportion of resources devoted to personnel expenditures in the day care industry. Group size does not appear to have an impact on cost per child, when other factors, particularly caregiver/child ratios and wage rates, are held constant. Caregiver qualifications have an influence on wage rates and thus have a modest effect on overall cost per child. Federally funded centers have higher costs per child than do parent-fee centers, but the difference appears to be wholly attributable to the three factors cited above.

Caregiver/Child Ratio: Taken by itself, caregiver/child ratio** appears to have the most substantial impact on cost per child of any single factor studied. Within the policy relevant range of ratios from 1:5 to 1:10, even small differences in the caregiver/child ratio can have a large impact on costs.

Ratio of Non-caregiving Staff to Children: Non-caregiving staff include directors and other administrative staff, in addition to the staff who provide supplementary services to children and families. While the ratio of non-caregivers to children is significantly related to per-child costs, no link has yet been established between the provision of specific services and cost per child. (Links between specific services and effects on children and parents also have not yet been established.) Further analysis of these relationships is being performed.

Wage Rates: The average wage rate paid by a center has a significant effect on center costs. The average wage rate of a center is in turn significantly affected by the educational attainment and tenure of its staff and its mix of teachers and aides. Wages are higher for staff members with more formal education and

The cost analyses were conducted at the center level. The caregiver/child ratio has been measured as the ratio of **scheduled caregiver hours to **scheduled** child hours for **all** caregivers and children at the center.*

longer tenure in their current center than are wages paid to staff with less education or longevity on the job. Teachers tend to have more education and experience than aides; moreover, as expected, wage rates for teachers are higher than those of aides even after adjusting for differences in education and experience. As a result, average wage rates tend to be relatively high where the ratio of teachers to aides is high. The presence or absence of specialization in a child-related area does not appear to have a significant impact on the wage rate, over and above the impact of formal education. It does not appear that caregiver's day care work experience prior to beginning work at the current center is related to the wage rate received. However, this issue is being explored further.

Group Size: Cost per child is not affected by variations in group size per se – as long as staff/child ratio, wages paid to classroom staff and the teacher/aide composition of classroom staff remain unchanged. If centers add children to groups without increasing the number of caregivers, cost per child will fall, but only because staff/child ratio has changed, not because of the addition of children per se. If caregivers were also added, keeping ratio constant, cost would not change. Similarly, if centers with large groups use a single teacher and several lower-paid aides to supervise each group, cost per child will be lower than in centers that maintain smaller groups, each supervised by a single teacher or by a teacher and only one aide. However, costs will differ only because average wage rates differ across the two types of centers, due to the different mixes of teachers and aides. If the mix did not differ, or if teachers and aides were paid the same, group size itself would not affect costs.

Federally Funded vs. Parent-fee Centers: The more a center depends on federal funding as opposed to parent fees, the higher its costs are likely to be. This difference between federally funded and parent-fee centers is due to higher ratios of caregivers and non-caregiving staff to children and higher wage rates that prevail in federally funded centers. When ratios and wage rates are held constant, there are no differences in cost per child between federally funded and parent-fee centers. However, wages are higher in federally funded centers than in parent-fee centers even when staff qualifications are held constant.

At this point, the reasons for the high ratios and wages in federally funded centers are partially matters of conjecture. However, some plausible explanations suggest themselves. First, the high caregiver/child ratios in federally funded centers are probably due in part to the FIDCR. Second, the high ratios of non-caregiving staff to children are probably associated with the relatively broad range of supplementary services offered to children and families in federally funded centers. Finally, the high wages paid by federally funded centers may be due to either or both of two factors: To a certain extent, centers receiving a relatively large share of their total income from government payments may be able to pass costs through to the government and may therefore be under relatively less pressure to control costs. In contrast, market pressure may act as a restraint on cost in centers relying primarily on parent fees. Alternatively, the higher wages paid in centers receiving proportionately large amounts of government funds may reflect a more rigorous enforcement of the minimum wage law in these centers. While the causes of the cost differential between federally funded and parent-fee centers were not a focus of the NDCS, it is clear from even the preliminary cost analyses presented here that cost factors of the kind just discussed warrant consideration in establishing policy or reimbursement rates at both the federal and state levels.

THE INFANT DAY CARE STUDY: PRELIMINARY FINDINGS AND IMPLICATIONS

The Infant Day Care Study was subsidiary to the main Cost/Effects Study of preschoolers. It was primarily intended to describe the day care arrangements currently available for children under three and not to examine the effects of alternative regulations on the quality of care. Nevertheless, the descriptive work has raised important regulatory issues. Some of these issues arose in the course of interviews with directors, staff and parents from 54 centers serving infants and toddlers. Others grew out of systematic observations of caregivers in infant and toddler classrooms in 38 of the 54 centers. The interviews and observations focused particularly on issues related to

group composition and staff qualifications. Some additional issues, on which the study provides only tangentially relevant data, are also briefly discussed at the end of this section.

Group Composition

Observations of staff/child ratio and group size in 54 centers showed that, on the average, centers maintained ratios for infant classrooms* that were higher than state-required minimums: observed ratios averaged 1:3.9, compared with an average required ratio of 1:5.3 for the states from which centers were sampled. In general, subsidized centers maintained ratios that were somewhat (but not dramatically) higher than centers funded by parent fees. A similar pattern was found for toddlers (an average observed ratio of 1:5.9 versus an average required ratio of 1:7.8).

Observed group sizes were smaller in infant groups (7.1 children) than in toddler groups (11.3 children). Group sizes for both infants and toddlers were significantly smaller than the maximum group sizes permitted by the FIDCR for three- and four-year-old children. (The FIDCR do not specify group sizes for children under three.)

Observations of day care classrooms indicated that the behavior of children and caregivers varied with both staff/child ratio and group size. Overt child distress was greater in low-ratio infant and toddler classrooms. Larger group size was associated with more overt distress in toddler classrooms, though not in infant classrooms. In low-ratio infant and toddler classrooms, staff spent more time managing and controlling children, more time silently monitoring children's activities, and less time in teaching of any kind. In large infant groups, caregivers spent less time on any kind of social interaction with children; teachers talked to children less, and there was less teaching. In general, these relationships were stronger for infant than toddler groups, particularly the relationship between ratio and distress.

Children under approximately 18 months of age were grouped in infant rooms in the study centers. Children between 18 and 30 months of age were grouped in toddler classrooms.

In short, both prevailing practices and NDCS observational data are consistent with the position that small group sizes and high staff/child ratios are associated with quality care for infants and toddlers. More specific discussion regarding particular levels of ratio and group size associated with quality care will be included in the NDCS final report.

Staff Qualifications

Many directors expressed concern about the quality of staff in their infant/toddler programs. Data from both the Supply Study survey and the Infant Study center visits show that infant and toddler caregivers have less formal education than preschool caregivers in the same centers. Few state regulations set separate staff qualifications specifically for this age group. Also, while regulations specify higher staff/child ratios for infants and toddlers, centers generally receive the same reimbursement from public agencies for these groups as they do for preschoolers, except in states where reimbursement is based directly on cost. To maintain equal costs for infant groups, centers may hire less-qualified (and thus lower-paid) staff, substitute administrative staff or provide less equipment and fewer materials.

The study examined relationships between caregiver qualifications and observed classroom behavior. Qualifications included years of education, degree to which education or training was specialized in early childhood, previous experience with young children, and time in current job. Education and specialization had stronger effects on caregiver's classroom behavior than did experience. Although education and degree of specialization were not highly correlated with each other, their relations to caregiver behavior tended to be highly similar. Greater education and more specialization (relatively rare in infant/toddler care) were associated with higher frequencies of social interaction and lower frequencies of observing and administrative activities. Caregiver education and specialization were also related to more teaching of language and verbal concepts and more extended conversation with children. In toddler groups, caregivers with more education and specialization exhibited more positive affect and touching. In infant groups, more

education and specialization for caregivers were associated with less severe distress exhibited by the infants in care. Although the staff who were interviewed stated that experience was more relevant to developing skill in working with children than was education, neither previous experience nor tenure in current job predicted differences in caregiver behavior.

Other Regulatory Issues

Parent Involvement: While neither center staff nor parents expressed a wish to see parents more involved in center administration, the data show that directors and caregivers perceive a need for more direct contact between parents and caregivers of very young children. Although parents were generally satisfied with the level of communication with staff, both directors and staff expressed a desire for parents to show more interest and to be better informed about their child's progress. In addition, directors and staff reported areas of potential disagreement (feeding, toileting, sleeping) between caregivers and parents that might be resolved by regular communication. Mechanisms for such communication between parents and caregivers are generally lacking.

Developmental Program: Parents choose to place their infants and toddlers in particular group care arrangements for a variety of reasons. They select *center* care, as opposed to family day care or in-home care, because of the adequacy and dependability of supervision, and the location and cost of the center, as well as for the developmental or educational nature of the program.

Parents' interest in an educational program for young children was shared by directors. Most directors, particularly in the South, felt that an educational program for infants and toddlers is desirable. Such a program, it was felt, should focus on an appropriate level of stimulation for children; on individual, adult/child or small group activities supervised by adults; and on provision of age-appropriate equipment and materials rather than a structured curriculum or periods of formal instruction. While directors, in general, support regulations aimed at specifying appropriate experiences for infants and toddlers, several indicated a feeling that specification of a rigid educational requirement is inappropriate for this age group. Many feel that it would be a mistake to formulate regulations for a program for infants and toddlers that are simple downward extensions of preschool standards.

Few centers had a well-articulated educational program for infants and toddlers. Also, the equipment in the infant and toddler rooms tended to be sparse, compared with equipment for older preschoolers. Interest in a developmental program for young children exists side-by-side with uncertainty about the contents of such a program.

Caregiver "Burnout" vs. Continuity of Care: Continuity of caregiver/child relationships is frequently discussed in the psychological literature and required in state regulations. It is widely believed that very young children need a single caregiver throughout the entire period of early development. To achieve such stability in the day care setting would require that caregivers work extended hours each week and remain at their jobs for several years. While the Infant Study was not designed to address the issue of continuity of care, data from the survey indicate that infant and toddler caregivers do work about three hours more each week than the caregivers of older children.

Unfortunately there may exist a trade-off between continuity of care and staff "burnout" – a detachment process related to the excessive demands of the task. Infant and toddler classrooms potentially require more energy from staff because of the relative lack of organized activities and the need for continous attention to the children. The data indicate that larger groups and lower ratios further reduce the potential for time off from child care classroom duties (i.e., more time is spent in child management and observation of children, and less time in administrative tasks). It seems reasonable to assert that concern for the continuity of care must be balanced with a concern for the quality of life for center staff, particularly in infant and toddler rooms where the quality of care is very likely related to the responsiveness of staff to subtle cues from children. However, no data currently exist to aid the policymaker in formulating regulations that strike the best achievable balance.

THE SUPPLY STUDY: PRELIMINARY FINDINGS AND IMPLICATIONS

A national survey of center-based day care is part of the research design of the NDCS. In addition to describing variations in programs, staff, finances and children across states and types of centers, the survey data are being used to extrapolate the national implications of the NDCS cost/effects analyses and to develop an econometric model of the impact of government regulations, funding policies and monitoring practices on the day care market. Between April 1976 and March 1977, over 3,100 day care center directors were interviewed by telephone. These centers constitute a stratified random sample of day care centers in the fifty states and the District of Columbia.

Preliminary analysis of survey data has been completed, and descriptive statistical profiles of center characteristics will soon be available.* Development of an econometric model to predict the impact of government regulations and funding policies on center behavior is now underway.** Reported below are those preliminary findings which are most relevant to the impact of federal regulations on the day care market. Only descriptive statistical results are presented, and they must be interpreted with some caution. Since a thorough testing of causal relationships remains to be completed, the effects of government regulations cannot yet be isolated from other potential determinants of center behavior.

Differences between FFP and non-FFP Centers

The term "federal financial participation" (FFP) is used to denote those day care centers which enroll children whose care is paid for under one of the sections of the Social Security Act (largely, Title XX). Of the 18,300 centers[§] in the United States, approximately 8,000 are FFP centers and are required to comply with the FIDCR. The 10,300 non-FFP centers are not subject to the FIDCR but must satisfy state day care regulations. There are over 400,000 children enrolled in FFP centers – about 45 percent of national center enrollment. Care for 225,000 of these children is paid for, at least in part, by direct government reimbursement. Care for the remaining 175,000 children in FFP centers is paid for primarily by parent fees.

The characteristics of children and families served are somewhat different between FFP and non-FFP centers. About half the children in FFP centers are members of minority groups, compared to one quarter of the children in non-FFP centers. Half of the families served by FFP centers have incomes below $6,000 per year, compared to only 14 percent of the families served by non-FFP centers. Three-, four- and five-year-olds comprise about 72 percent of center enrollment nationally; the remaining 28 percent is split evenly between infant/toddlers and school-age children. In FFP centers, three-, four- and five-year-olds constitute a slightly higher than average percentage of enrollment and infant/toddlers a slightly lower than average percentage. The reverse is true in non-FFP centers.

The most significant differences between FFP and non-FFP centers are in the area of program characteristics. A much higher percentage of FFP centers than non-FFP centers offer supplementary services to children and parents – health and developmental examinations as well as transportation for children, counseling or other social services for parents. In general, the children and families served by FFP centers have about twice as high a probability of receiving such services as their counterparts in non-FFP centers. Parents serve more frequently as volunteers in FFP centers and participate more frequently in selection of staff and in decisions on budgets and programs. Children in all day care centers are grouped very homogeneously by age, but the age range of children in classrooms tends to be slightly

*Characteristics of Center-based Day Care in the United States, 1976-1977 *(Cambridge, MA: Abt Associates, March 1978).*

**The Supply Study econometric model will appear as part of the NDCS final report.

§This number is preliminary and subject to upward revision as estimates of new centers starting up during the period of the survey are calculated. "Center" is defined here as a facility with capacity to provide non-live-in child care services to 13 or more predominantly non-handicapped children, having at least one child enrolled 25 or more hours per week and open at least nine months each year.

higher in FFP centers than in non-FFP centers. Class size tends to be larger in FFP centers than in non-FFP centers for children of the same age, but the frequency of multiple-caregiver classrooms is also higher in FFP centers.

Staff/child ratios are significantly lower (i.e., there are more children per caregiver) in non-FFP centers than in FFP centers. In FFP centers the center-level ratio of full-time-equivalent children to full-time-equivalent caregivers is 1:5.9, compared to 1:7.6 in non-FFP centers. These ratio estimates are based on a reported average daily attendance rate for children of 88 percent and represent an average staff/child ratio across all ages of children. About 45 percent of FFP centers have an average of fewer than five children per caregiver, compared to only 21 percent of non-FFP centers. At the other extreme, only four percent of FFP centers have an average of more than 11 children per caregiver, compared to 13 percent of non-FFP centers.

The qualifications of staff with similar responsibilities are not significantly different between FFP and non-FFP centers, but the composition of staff is quite different. Although average enrollment is only slightly higher in FFP centers than in non-FFP centers (50 children vs. 47), the total average number of staff available in FFP centers is 14, versus 9 in the non-FFP centers. A larger percentage of the staff in FFP centers volunteer their time and a larger percentage work only part-time. The ratio of non-caregiver staff to children, like the ratio of caregivers to children, is significantly higher in FFP centers. Among the non-caregiver staff in FFP centers there is a higher frequency of direct service specialists – social workers, nurses and psychologists. The educational attainment and previous work experience of directors and caregivers are not significantly different between the two types of centers. Directors in FFP centers have completed slightly more years of education than their counterparts in non-FFP centers but have somewhat less previous day-care-related experience. There is no difference in the educational attainment of caregivers between the two types of centers, but caregivers in non-FFP centers do have slightly more job-related work experience.

Given these differences in services offered, staff size and staff composition, it is not surprising to find a significant difference in expenditures per child between FFP and non-FFP centers. FFP centers on the average spend $147 per child per month to provide day care services compared to $91 per child per month in non-FFP centers – a difference of 60 percent. These figures reflect differences only in actual cash expenditures and do not include differences in the value of donated time, space and equipment.* Since the frequency and dollar value of donated time and material are higher in FFP centers than in non-FFP centers, the difference in resource cost per child per month between the two categories of centers is higher than 60 percent. Because of the complications introduced by the presence of partially subsidized children in FFP centers (fees paid partly by parents and partly by government), it is not yet possible to translate differences in expenditures per child into differences in fee structure between the two categories of centers.

Degree of Racial and Economic Segregation

The degree of racial and economic segregation in subsidized day care is an important policy issue. Further analysis will be required before any definitive conclusions can be reached on the relative degree of racial and economic mixing between FFP and non-FFP centers. Analysis is underway on the degree to which differences in the level of segregation are due to federal regulations as opposed to being the natural consequences of government subsidies going primarily to low-income families, most of whom live in low-income neighborhoods. Nevertheless, the analyses that have been completed to date do have some relevance to the segregation issue.

One would expect higher concentrations of low-income and minority children in FFP centers. FFP centers by definition, serve at least some children from welfare families, whereas non-FFP centers, again by definition, enroll no subsidized children. Since the

Note that the estimate of resource costs per child presented on page 17 for the 57 study centers ($161 per month) includes the value of donated time, space and material.

incidence of poverty is higher among minority than among non-minority families, higher concentrations of low-income families in FFP centers should be accompanied by higher concentrations of minority families. Compounding the influence of government subsidies, the relatively small size of the catchment areas served by centers limits the degree of integration that is feasible in FFP centers located in low-income neighborhoods. Finally, in most states, federal funding regulations require more expensive day care than do state licensing regulations. As a result, FFP day care may be too expensive to attract many parent-fee children from middle-income families. All of these factors lead one to expect that low-income and minority children will be relatively isolated in FFP centers. In fact, however, the evidence available to date indicates that the degree of racial and/or socioeconomic segregation in FFP day care centers is not higher than in non-FFP centers.

FFP centers are less racially segregated than non-FFP centers. About 65 percent of non-FFP centers have enrollments that are 90 percent or more white children; another 12 percent have enrollments that are 90 percent or more minority group children. The remaining 23 percent of non-FFP centers have better than a 90/10 racial mixture. In contrast, 41 percent of FFP centers have a better than 90/10 racial mixture. Using 80/20 and 70/30 definitions of racial mix, one still finds significant differences between FFP and non-FFP centers. Thus it appears that, contrary to the expectation of a higher degree of racial segregation in FFP centers, the racial mix in subsidized centers is actually more balanced than in non-FFP centers.

The income distribution of families served by FFP centers is quite different from the income distribution of families served by non-FFP centers. The following statistics indicate, however, that the degree of socioeconomic mixing in day care centers is higher than one might expect.

- Virtually all FFP centers serve low-income families. However, only 24 percent of FFP centers draw 90 percent or more of their enrollments from families with annual incomes below $6,000 and more than half serve some families with incomes above $15,000.
- Half of the nation's non-FFP centers enroll some children from families with incomes below $6,000 per year. About eight percent of non-FFP centers draw 90 percent or more of their enrollment from families with incomes below $6,000.

Most of the income mixing in FFP centers is between the under-$6,000 and $6,000-to-$15,000 income categories. In non-FFP centers the income mix is generally between the $6,000-to-$15,000 and $15,000-and-above categories. Further analysis will be required to determine the degree to which the socioeconomic composition of enrollment in FFP centers is due to government regulations as opposed to the socioeconomic characteristics of the catchment areas that FFP centers serve.

Degree of Compliance with Regulations

As noted above, non-FFP centers are required to comply only with state day care regulations, while FFP centers must comply with the FIDCR as well as state regulations. Under current federal guidelines (*Federal Register,* 31 January 1977), state day care agencies are permitted to waive FIDCR compliance in those FFP centers serving no more than five subsidized children or 20 percent of enrollment, whichever is lower. Some states have chosen not to issue waivers, and others have chosen to issue waivers for only some of their waiver-eligible centers. For purposes of the following discussion on the degree of regulatory compliance, FFP centers have been separated into two categories – those ineligible for FIDCR waivers (FFP/NW) and those who are eligible for waivers (FFP/WE). Of the 8000 FFP centers, about 1500 (19 percent) are in the FFP/WE category.

Much of the previous debate on the appropriateness of the FIDCR has focused on staff/child ratio requirements. Averaged across all centers, all states and all ages of children, current state regulations permit a maximum of about 12 children per caregiver, while the maximum permitted by FIDCR is about six children per caregiver. The variability of ratio requirements across states is quite large. The average requirement across all ages of children in Arizona and Hawaii is about 17.5 children per caregiver; in Connecti-

cut and New York an average of about 6.3 children per caregiver is the legal maximum. Mississippi imposes no ratio requirement at all on non-FFP centers. The major disparities between federal and state ratio requirements occur for children between the ages of two and five years. For children under two years of age and for school-age children, federal and state ratio requirements are relatively similar.

The degree of compliance with state licensing requirements regarding staff/child ratio is very high, regardless of type of center.* About 94 percent of all centers have sufficient classroom staff to comply with state staffing requirements. The degree of compliance is slightly higher than average among FFP/NW centers (96 percent) and slightly lower than average among non-FFP centers (92 percent). Most of the centers which are not in compliance with state requirements are in those states in which the state requirements are very high. For those centers not currently in compliance, a total of only 1400 additional caregivers would be required to achieve compliance. In contrast, those centers which currently comply with state regulations have about 51,000 full-time-equivalent caregivers in excess of the minimum numbers required to satisfy state regulations.

The degree of compliance with the FIDCR staff/child ratio requirement varies widely across categories of centers. About 72 percent of FFP/NW centers have sufficient classroom staff to comply with the FIDCR. Among FFP/WE and non-FFP centers only 45 and 38 percent, respectively, of centers have sufficient caregivers to satisfy the FIDCR. Within the FFP/NW category, the degree of compliance varies by type of center – 79 percent among non-profit centers versus only 45 percent among proprietary centers. To bring all non-complying FFP centers up to FIDCR standards, about 5,500 additional full-time-equivalent caregivers would be required – an average of about two full-time persons per non-complying center. Among those FFP centers currently satisfying FIDCR, however, about 12,500 full-time-equivalent caregivers are currently available in excess of the minimum numbers required.

There are various other provisions of the FIDCR for which measures of the degree of compliance are available. The FIDCR specify the maximum number of children that can be placed in a single group or classroom. About 60 percent of FFP centers reported groups or classrooms which met the FIDCR limits. Of the remaining 40 percent, many centers appear to be organized on an open-classroom basis, for which reported group size may well be much larger than effective group size (a cluster of children under the direct supervision of one or more caregivers at a given time of day). As a result, it appears that more than 60 percent of FFP centers are currently in compliance with the FIDCR group size provisions. About 68 percent of non-FFP centers reported groups or classrooms which met the FIDCR limits. Since the frequency of open-classroom arrangements is lower among non-FFP centers, measures of compliance based on effective group sizes should show no differences between FFP and non-FFP centers.

The FIDCR require that FFP centers with more than 40 children enrolled allow parents an active voice in center decision-making. If parent involvement is defined as participation in staff selection or review of programs and budgets, it is estimated that 69 percent of FFP/NW and 45 percent of FFP/WE centers comply with this FIDCR provision. This definition of participation is much narrower than the definition currently recommended by HEW's Administration for Public Services for monitoring purposes. The Administration's definition includes volunteer work by parents and/or opportunity for parents to observe their children in center classrooms as alternative evidence of FIDCR compliance. Virtually all centers comply with this definition of parent participation.

*The minimum number of caregiver hours required for children in each age category was determined by taking the number of hours of care provided for a specific age group (scheduled hours adjusted to reflect average daily attendance) and multiplying that number by the ratio of staff hours to child hours required by state or federal regulations. For example, for every 200 hours of care provided to three-year-olds, the FIDCR require 40 hours of caregiver time (200 hours x a 1:5 ratio of staff hours to child hours.) Adding the required number of caregiver hours for all age groups served by a center and dividing by the total hours of child care provided gave a center-level measure of compliance with the ratio mandated by state or federal regulations.

The FIDCR, as well as most state day care regulations, require that children have a medical examination at the time they enroll in day care centers. About 90 percent of all day care centers comply with this requirement. The degree of compliance is slightly higher for non-FFP centers (92 percent) than for FFP centers (89 percent). In addition, the FIDCR require that children undergo periodic health examinations during the time they are enrolled in centers. About half of FFP centers versus about 20 percent of non-FFP centers provide or facilitate such examinations for the children they enroll.